REMARKS

This amendment is a resubmit of an earlier filed paper (which erroneously indicated serial number 09/228,817). Applicant apologizes for any inconvenience and

5   miscorrelation caused by the error.

Claims 17-19 stand rejected due to an informality in claim 17. This informality has been corrected. Applicant submits that this error was a typographical error and its correction does not narrow the scope of the claim.

Claims 11, 13 and 33 stand rejected under 35 USC § 112, ¶ 2 as being indefinite

10   for allegedly failing to point out and distinctly claim the subject matter which applicant regards as the invention. In claim 11, the alleged deficiency is that the valid bit may indicate that the dependent instruction is invalid and that it was not previously defined how the valid bit defines whether the dependent instruction is valid or invalid. Applicant believes this alleged shortcoming is overcome by adding the full antecedent basis for

15   instruction in that phrase (i.e., dependent instruction). Likewise, applicant believes this amendment addresses the concern with regard to claim 13.

With regard to claim 33, applicant believes that alleged deficiency has been remedied. The data representing the integrated circuit comprises data representing a plurality of mask layers.

20   Claims 1-17, 20-32, 34 and 35 stand rejected under 35 USC § 102(a) as being anticipated by US Pat. No. 6,047,370 (hereafter Grochowski). To set forth a prima facie case of anticipation, a prior art reference must describe each and every element of the claims. Applicant respectfully submits that this burden has not been met.

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In this case, the Office Action states that Grochowski provides a replay system and also provides a replay system to replay an altered instruction formed from changing the original instruction if the execution unit executes the instruction erroneously. The Office Action points to Grochowski at Col. 7, ll. 9-13 to identify problems or instructions

5   executing incorrectly. Indeed Grochowski does identify some problems that may occur during instruction execution.

> Many types of problems may be detected. Exemplary problems in one particular embodiment include:
> (1) a cache miss;
> 10   (2) a branch or predicate misprediction;
> (3) an exception, such as a page fault or an illegal instruction;
> (4) a translation look-aside buffer ("TLB") miss; and
> (5) certain data dependencies, such as load/store conflicts.

15   The Office Action further points to Col. 7, ll. 30-34 and states that this portion should be equated to "changing said original instruction". Office Action, p. 4, ¶ 5, l. 8. Moreover, the Office Action refers to Col. 7, ll. 25-29 to allegedly indicate how the instruction can be formed from changing the original instruction.

Applicant respectfully submits that a close inspection of Grochowski indicates

20   that Grochowski does not suggest replaying an altered instruction formed from changing the original instruction if the execution unit executes the instruction erroneously. The cited portion at Col. 7, ll. 25-29 states:

> Once a problem is detected, the problem and its effects must be repaired. Again, the repair will be implementation specific depending on, among other things, the nature of the problem.
> 25   For instance, if the problem is:
> (a) a predicate misprediction, the correct predicate must be inserted for the replay; or
> (b) a load store conflict, the store must be completed, the cache updated, and then the correct value loaded.

30   The first example given by Grochowski is the case of a predicate misprediction. In the case of a predicate misprediction, Grochowski counsels that the correct predicate must be inserted for the replay. Thus, Grochowski suggests that is a prediction is taken

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on the predicate and that the prediction turns out to be wrong, then the prediction must be

corrected to have proper execution. The proper predicate may be added to the instruction

to undo the incorrect speculation. Applicant respectfully submits that providing the

proper predicate to an instruction does not morph that instruction. Providing the proper

5   predicate is akin to providing the proper branch address or operand. The underlying

instruction is not altered.

The second example given by Grochowski is a load/store conflict. A load/store

conflict may occur in a read after write (RAW) situation. In the case where a read tries to

write data that has not yet been written, then a conflict may occur. In this case,

10 Grochowski counsels that one must delay reading the data until the data has been written.

Thus, the same instruction is retried again at a later time. There is no alteration necessary

to retry or replay the exact same instruction at a later time.

The Office Action further points to the passage of Grochowski at Col. 7, ll. 30-34:

15
> Problem repair can be quickly performed because the queue 15 has stored the intermediate
> state of the pipeline 10. Thus, the problem can be identified and corrected in the queue 15 and
> the execution stream replayed. The effects of the problem will then necessarily be corrected in
> the replay.

Again, however, applicant respectfully submits that Mr. Grochowski is not

20 counseling the alteration of an instruction formed from changing said original instruction

if the execution unit executes the instruction erroneously. The queue 15 in one

embodiment stores "micro-ops" (Col. 4, l. 42), and "[t]he queued micro-ops define an

intermediate state of the machine." Col. 4, ll. 50-51. Grochowski advocates the use of

replay of the same instructions, not altered ones. Grochowski explains that in the case of a

25 problem occurring, the pipeline 10 is either flushed or drained and the uncommitted

results are squashed. Col. 7, ll. 35-38. "The pipeline 10 then requests a replay over the

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channel. * * * Execution of the queued micro-ops then commences as described above."
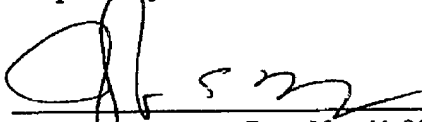
Col. 35, ll. 38 – 42.

Thus, applicant respectfully submits that Grochowski does not indeed teach a replay system to replay an altered instruction formed from changing said original

5   instruction if the execution unit executes the instruction erroneously.

Applicants submit that all claims now pending are in condition for allowance at least due to their dependency on an allowable base claim. Such action is earnestly solicited at the earliest possible date. If there is a deficiency in fees, including any necessary extension fees, please charge our Deposit Acct. No. 02-2666.

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Respectfully submitted,

Date: __5/26/04__

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